

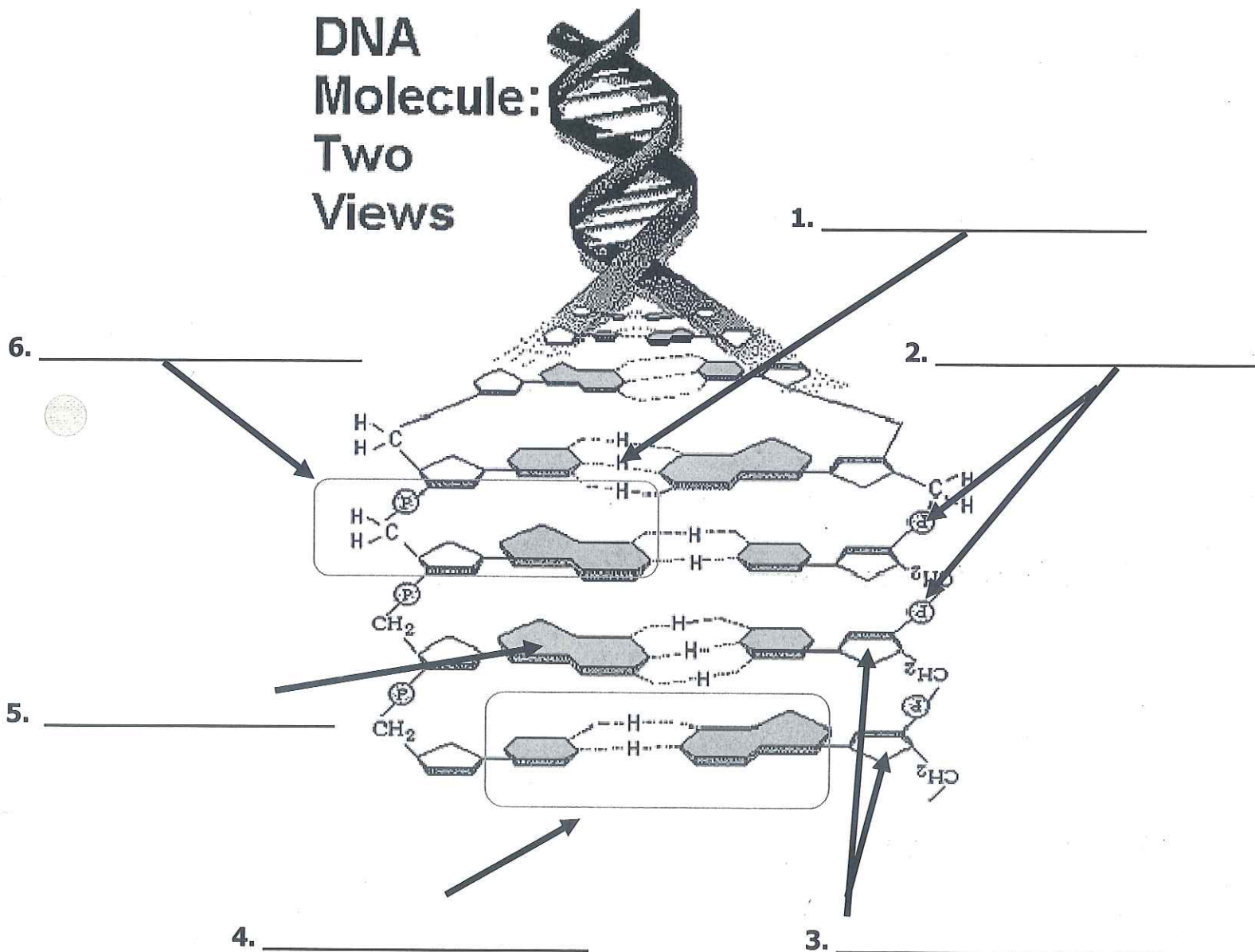
Name: _____ Date: _____ Period: _____

Worksheet – Structure of DNA and Replication

Directions: Label the diagram below with the following choices:

- Nucleotide
- Deoxyribose
- Phosphate group
- Base pair
- Hydrogen bond
- Nitrogenous base

DNA Molecule: Two Views



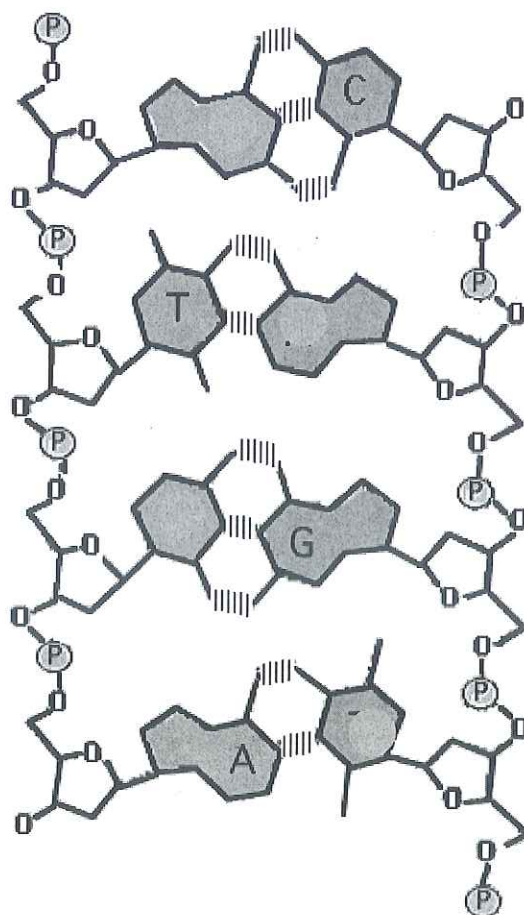
Directions: Complete each sentence.

7. Guanine, cytosine, thymine, and _____ are the four _____ in DNA.
8. In DNA, guanine always forms hydrogen bonds with _____.
9. The process of _____ produces a new copy of an organism's genetic information, which is passed on to a new cell.
10. The double coiled, "staircase" shape of DNA is called a _____.

Directions: Answer each question in complete sentences.

11. What do the letters DNA stand for?

12. Where is DNA found? _____
13. Label the **nucleotides** (A, T, G, C) in the DNA molecule below:



15. What is the first step in the process of DNA replication?

16. Which enzyme is responsible for "unzipping" the DNA double helix?

17. Which enzyme is responsible for facilitating the hydrogen bonding between nucleotides in a new DNA molecule?

18. Which enzyme is responsible for creating the covalent bonds that connect the sugar-phosphate backbone of the new DNA molecules?

19. If the sequence of one single strand of DNA is C-A-A-G-T-A-G-G-C-T, what is the sequence of the complementary strand?

20. Describe the origin of each strand of the new double helix created after DNA replication.

21. Why is DNA replication important to the growth and development of a multi-cellular organism?

22. List the 3 basic steps of DNA replication:

a.

b.

c.

23. The model of DNA below is ready to be copied. Compared to the **original** double helix, evaluate the copies made during three attempts of DNA replication. List any errors with the replication if they occurred:

Original

A	T
T	A
C	G
C	G
G	C
T	A
G	C

Replication #1

A	T
T	A
C	G
C	G
G	C
T	A
G	C

AND

A	T
T	A
C	G
A	G
G	C
T	A
G	C

List problems if any:

Replication #2

A	T
T	A
C	G
C	G
G	C
T	A
G	C

AND

A	T
T	A
C	G
C	G
G	C
T	A
G	C

List problems if any:

24. Complete the diagram on the left. Then circle the areas in the diagram on the right that show a genetic mutation.

DNA Correctly Copied

A	
G	
C	
T	
A	
T	
A	



DNA Incorrectly Copied

A	
G	
C	
T	
A	
T	
A	



A	T
G	C
C	G
T	A
A	T
T	G
A	T

G	T
G	C
C	G
T	A
A	T
C	A
A	T

25. Explain how the mutations might have been caused in the diagram above.
